

AMENDMENTS TO THE CLAIMS

1. (Currently amended) An active material for an electrode, comprising:

a lithium-containing complex oxide represented by General Formula:

$\text{Li}_{1+x+\alpha}\text{Ni}_{(1-x-y+\delta)/2}\text{Mn}_{(1-x-y-\delta)/2}\text{M}_y\text{O}_2$ (where $0 \leq x \leq 0.15$, $-0.05 \leq x+\alpha \leq 0.2$, $0 \leq y \leq 0.4$; $-0.1 \leq \delta \leq 0.1$ ~~(when $0 \leq y \leq 0.2$) or $-0.24 \leq \delta \leq 0.24$ (when $0.2 < y \leq 0.4$)~~; and M is at least one element selected from the group consisting of Mg, Ti, Cr, Fe, Co, Cu, Zn, Al, Ge, Zr and Sn), the lithium-containing complex oxide comprising secondary particles formed of flocculated primary particles,

wherein the primary particles have a mean particle diameter of 0.3 to 3 μm , ~~and~~

the secondary particles have a mean particle diameter of 5 to 20 μm , and

the lithium-containing complex oxide has a BET specific surface area of 0.3 to 2 m^2/g .

2. (Original) The active material for an electrode according to claim 1, wherein $x \leq 0.05$ and $x+\alpha \leq 0.05$.

3. (Original) The active material for an electrode according to claim 1, wherein in the General Formula, $y > 0$ and M is one or more elements containing at least Co.

4. (Currently amended) The active material for an electrode according to claim 1, wherein Mn of the lithium-containing complex oxide has ~~a BET specific surface area of 0.3 to 2 m^2/g~~ an average valence of 3.3 to 4.

5. (Currently amended) An active material for an electrode, comprising:

a lithium-containing complex oxide A represented by General Formula:

$\text{Li}_{1+x+\alpha}\text{Ni}_{(1-x-y+\delta)/2}\text{Mn}_{(1-x-y-\delta)/2}\text{M}_y\text{O}_2$ (where $0 \leq x \leq 0.15$, $-0.05 \leq x+\alpha \leq 0.2$, $0 \leq y \leq 0.4$; $-0.1 \leq \delta \leq 0.1$ ~~(when $0 \leq y \leq 0.2$) or $-0.24 \leq \delta \leq 0.24$ (when $0.2 < y \leq 0.4$)~~; and M is at least one element selected from the group consisting of Mg, Ti, Cr, Fe, Co, Cu, Zn, Al, Ge, Zr and Sn), the lithium-containing complex oxide A comprising secondary particles formed of flocculated

primary particles, the secondary particles having a mean particle diameter of 5 to 20 μm , Mn having an average valance of 3.3 to 4; and

a lithium-containing complex oxide B having a mean particle diameter smaller than the mean particle diameter of the secondary particles of the lithium-containing complex oxide A.

6. (Original) The active material for an electrode according to claim 5, wherein $x \leq 0.05$ and $x + \alpha \leq 0.05$.

7. (Original) The active material for an electrode according to claim 5, wherein the lithium-containing complex oxide B is contained in a ratio of 10% to 40% by weight with respect to a whole of the lithium-containing complex oxide A and the lithium-containing complex oxide B.

8. (Original) The active material for an electrode according to claim 5, wherein the mean particle diameter of the lithium-containing complex oxide B is not greater than $3/5$ of that of the secondary particles of the lithium-containing complex oxide A.

9. (Original) The active material for an electrode according to claim 5, wherein in the General Formula, $y > 0$ and M is one or more elements containing at least Co.

10. (Original) The active material for an electrode according to claim 5, wherein the lithium-containing complex oxide A has a BET specific surface area of 0.3 to 2 m^2/g .

11. (Original) The active material for an electrode according to claim 5, wherein the lithium-containing complex oxide B is a complex oxide of secondary particles formed of flocculated primary particles.

12. (Original) The active material for an electrode according to claim 5, wherein Ni, Mn and the element M of the lithium-containing complex oxide A have a valence of 2, 4 and 3, respectively.

13. (Original) The active material for an electrode according to claim 5, wherein the lithium-containing complex oxide B has the same composition as the lithium-containing complex oxide A or is represented by General Formula: $\text{Li}_{1+a+b}\text{R}_{1-a}\text{O}_2$ (where $0 \leq a \leq 0.05$ and $-0.05 \leq a+b \leq 0.05$, and R is at least one element selected from the group consisting of Mg, Ti, Cr, Fe, Co, Cu, Zn, Al, Ge, Zr and Sn).

14. (Currently amended) An active material for an electrode, comprising:

a lithium-containing complex oxide represented by General Formula:

$\text{Li}_{1+x+\alpha}\text{Ni}_{(1-x-y+\delta)/2}\text{Mn}_{(1-x-y-\delta)/2}\text{M}_y\text{O}_2$ (where $0 \leq x \leq 0.15$, $-0.05 \leq x+\alpha \leq 0.2$, $0 \leq y \leq 0.4$; $-0.1 \leq \delta \leq 0.1$ ~~(when $0 \leq y \leq 0.2$) or $-0.24 \leq \delta \leq 0.24$ (when $0.2 < y \leq 0.4$)~~; and M is at least one element selected from the group consisting of Mg, Ti, Cr, Fe, Co, Cu, Zn, Al, Ge, Zr and Sn), the lithium-containing complex oxide comprising secondary particles formed of flocculated primary particles,

wherein the secondary particles having a mean particle diameter of 5 to 20 μm are contained in a ratio of 60% to 90% by weight with respect to a whole of the lithium-containing complex oxide, and

the secondary particles having a mean particle diameter of not greater than 3/5 of the mean particle diameter of 5 to 20 μm are contained in a ratio of 10% to 40% by weight with respect to the whole of the lithium-containing complex oxide.

15. (Original) The active material for an electrode according to claim 14, wherein $x \leq 0.05$ and $x+\alpha \leq 0.05$.

16. (Currently amended) A non-aqueous secondary battery comprising:

a positive electrode comprising a ~~lithium-containing complex oxide as an~~ a positive electrode mixture comprising the active material for an electrode according to claim 1;

a negative electrode; and

a non-aqueous electrolyte;

~~wherein the lithium containing complex oxide is represented by General Formula:~~
 ~~$\text{Li}_{1+x+\alpha}\text{Ni}_{(1-x-y+\delta)/2}\text{Mn}_{(1-x-y-\delta)/2}\text{M}_y\text{O}_2$ (where $0 \leq x \leq 0.15$, $0.05 \leq x+\alpha \leq 0.2$, $0 \leq y \leq 0.4$, $0.1 \leq \delta \leq 0.1$ (when $0 \leq y \leq 0.2$) or $0.24 \leq \delta \leq 0.24$ (when $0.2 < y \leq 0.4$); and M is at least one element selected from the group consisting of Mg, Ti, Cr, Fe, Co, Cu, Zn, Al, Ge, Zr and Sn) and comprises secondary particles formed of flocculated primary particles;~~
~~the primary particles have a mean particle diameter of 0.3 to 3 μm , and~~
~~the secondary particles have a mean particle diameter of 5 to 20 μm .~~

17. (Original) The non-aqueous secondary battery according to claim 16, wherein $x \leq 0.05$ and $x+\alpha \leq 0.05$.

18. (Original) The non-aqueous secondary battery according to claim 16, wherein in the General Formula, $y > 0$ and M is one or more elements containing at least Co.

19. (Canceled).

20. (Currently amended) A non-aqueous secondary battery comprising:

a positive electrode comprising a ~~lithium containing complex oxide as an~~ positive electrode mixture comprising the active material for an electrode according to claim 5;

a negative electrode; and

a non-aqueous electrolyte;

~~wherein the lithium containing complex oxide comprises~~

~~a lithium containing complex oxide A represented by General Formula: $\text{Li}_{1+x+\alpha}\text{Ni}_{(1-x-y+\delta)/2}\text{Mn}_{(1-x-y-\delta)/2}\text{M}_y\text{O}_2$ (where $0 \leq x \leq 0.15$, $0.05 \leq x+\alpha \leq 0.2$, $0 \leq y \leq 0.4$, $0.1 \leq \delta \leq 0.1$ (when $0 \leq y \leq 0.2$) or $0.24 \leq \delta \leq 0.24$ (when $0.2 < y \leq 0.4$); and M is at least one element selected from the group consisting of Mg, Ti, Cr, Fe, Co, Cu, Zn, Al, Ge, Zr and Sn), the lithium containing complex oxide A comprising secondary particles formed of flocculated primary particles, the secondary particles having a mean particle diameter of 5 to 20 μm , and~~

~~_____ a lithium-containing complex oxide B having a mean particle diameter smaller than the mean particle diameter of the secondary particles of the lithium-containing complex oxide A.~~

21. (Original) The non-aqueous secondary battery according to claim 20, wherein $x \leq 0.05$ and $x + \alpha \leq 0.05$.

22. (Original) The non-aqueous secondary battery according to claim 20, wherein the lithium-containing complex oxide B is contained in a ratio of 10% to 40% by weight with respect to a whole of the lithium-containing complex oxide A and the lithium-containing complex oxide B.

23. (Original) The non-aqueous secondary battery according to claim 20, wherein the mean particle diameter of the lithium-containing complex oxide B is not greater than $3/5$ of that of the secondary particles of the lithium-containing complex oxide A.

24. (Original) The non-aqueous secondary battery according to claim 20, wherein in the General Formula, $y > 0$ and M is one or more elements containing at least Co.

25. (Original) The non-aqueous secondary battery according to claim 20, wherein the lithium-containing complex oxide A has a BET specific surface area of 0.3 to $2 \text{ m}^2/\text{g}$.

26. (Original) The non-aqueous secondary battery according to claim 20, wherein the lithium-containing complex oxide B is a complex oxide of secondary particles formed of flocculated primary particles.

27. (Original) The non-aqueous secondary battery according to claim 20, wherein the lithium-containing complex oxide B has the same composition as the lithium-containing complex oxide A or is represented by General Formula: $\text{Li}_{1+a+b}\text{R}_{1-a}\text{O}_2$ (where $0 \leq a \leq 0.05$ and $-0.05 \leq a+b \leq$

0.05, and R is at least one element selected from the group consisting of Mg, Ti, Cr, Fe, Co, Cu, Zn, Al, Ge, Zr and Sn).

28. (Original) The non-aqueous secondary battery according to claim 20, wherein Ni, Mn and the element M of the lithium-containing complex oxide A have a valence of 2, 4 and 3, respectively.

29. (Currently amended) A non-aqueous secondary battery comprising:

a positive electrode comprising a ~~lithium-containing complex oxide as an~~ positive electrode mixture comprising the active material for an electrode according to claim 14;

a negative electrode; and

a non-aqueous electrolyte;

~~wherein the lithium-containing complex oxide is a complex oxide represented by General Formula: $\text{Li}_{1+x+\alpha}\text{Ni}_{(1-x-y-\delta)/2}\text{Mn}_{(1-x-y-\delta)/2}\text{M}_y\text{O}_2$ (where $0 \leq x \leq 0.15$, $0.05 \leq x+\alpha \leq 0.2$, $0 \leq y \leq 0.4$, $0.1 \leq \delta \leq 0.1$ (when $0 \leq y \leq 0.2$) or $0.24 \leq \delta \leq 0.24$ (when $0.2 < y \leq 0.4$); and M is at least one element selected from the group consisting of Mg, Ti, Cr, Fe, Co, Cu, Zn, Al, Ge, Zr and Sn), the complex oxide comprising secondary particles formed of flocculated primary particles;~~

~~the secondary particles having a mean particle diameter of 5 to 20 μm are contained in a ratio of 60% to 90% by weight with respect to a whole of the complex oxide, and~~

~~the secondary particles having a mean particle diameter of not greater than 3/5 of the mean particle diameter of 5 to 20 μm are contained in a ratio of 10% to 40% by weight with respect to the whole of the complex oxide.~~

30. (Original) The non-aqueous secondary battery according to claim 29, wherein $x \leq 0.05$ and $x+\alpha \leq 0.05$.

31. (New) The active material for an electrode according to claim 1, wherein in the General Formula, a ratio of Ni, Mn and M is in a vicinity of 5:5:2.

32. (New) The active material for an electrode according to claim 5, wherein in the General Formula, a ratio of Ni, Mn and M is in a vicinity of 5:5:2.

33. (New) The active material for an electrode according to claim 14, wherein in the General Formula, a ratio of Ni, Mn and M is in a vicinity of 5:5:2.

34. (New) The active material for an electrode according to claim 1, wherein in the General Formula, a ratio of Ni, Mn and M is in a vicinity of 1:1:1.

35. (New) The active material for an electrode according to claim 5, wherein in the General Formula, a ratio of Ni, Mn and M is in a vicinity of 1:1:1.

36. (New) The active material for an electrode according to claim 14, wherein in the General Formula, a ratio of Ni, Mn and M is in a vicinity of 1:1:1.

37. (New) A non-aqueous secondary battery comprising:

- a positive electrode comprising a positive electrode mixture comprising the active material for an electrode according to claim 31;

- a negative electrode and

- a non-aqueous electrolyte.

38. (New) A non-aqueous secondary battery comprising:

- a positive electrode comprising a positive electrode mixture comprising the active material for an electrode according to claim 32;

- a negative electrode and

- a non-aqueous electrolyte.

39. (New) A non-aqueous secondary battery comprising:

a positive electrode comprising a positive electrode mixture comprising the active material for an electrode according to claim 33;

a negative electrode and

a non-aqueous electrolyte.

40. (New) A non-aqueous secondary battery comprising:

a positive electrode comprising a positive electrode mixture comprising the active material for an electrode according to claim 34;

a negative electrode; and

a non-aqueous electrolyte.

41. (New) A non-aqueous secondary battery comprising:

a positive electrode comprising a positive electrode mixture comprising the active material for an electrode according to claim 35;

a negative electrode; and

a non-aqueous electrolyte.

42. (New) A non-aqueous secondary battery comprising:

a positive electrode comprising a positive electrode mixture comprising the active material for an electrode according to claim 36;

a negative electrode; and

a non-aqueous electrolyte.

43. (New) The non-aqueous secondary battery according to claim 16, wherein the positive electrode mixture has a density of at least 2.9 g/cm^3 .

44. (New) The non-aqueous secondary battery according to claim 20, wherein the positive electrode mixture has a density of at least 2.9 g/cm^3 .

Application No. 10/717,772
Amendment dated June 26, 2006 (Monday)
Reply to Office Action of March 24, 2006

Docket No.: 5271-0109PUS1

45. (New) The non-aqueous secondary battery according to claim 29, wherein the positive electrode mixture has a density of at least 2.9 g/cm^3 .